QUALITY IN COMMAND - SINCE 1937

CAESAR PROPULSION CONTROL SYSTEMS



CAESAR PCS FOR HIGH-SPEED-CRAFTS

The CAESAR Propulsion Control Systems (CAESAR PCS) are designed for the control of propulsion, steering and motion damping devices onboard of High Speed Crafts (HSC). The system has a modular design with emphasis on weight-saving. This allows for its application on various types of HSC, such as (wave-piercing) catamarans, fast supply vessels, trimarans, naval vessels and highspeed yachts. It enables integrated remote control of all onboard waterjets, rudders and motion damping devices.

The CAESAR PCS interfaces with available machinery sensors and actuators to control waterjet buckets, steering nozzles (via proportional valves) and auxiliary controls operating hydraulic pump(s), clutch and thrustbearing.

High-Speed-Craft systems consist of multiple control cabinets, each with individual controllers for independent operation. Cabinets contain two digital controllers (main

and back-up) where the controller can operate up to two waterjets. Main controllers operate follow-up steering control and power/reversing control. Whereas the backup controller operates jog-switch back-up control and indication of the steering nozzle, bucket and impeller speed.

The CAESAR PCS is developed and designed in accordance with the IMO High-Speed Craft Code 2000. Modularity and use of generic hardware allows independence of availability of Commercial-Off-The-Shelf (COTS) hardware. Each system is assembled at the Kwant Controls' facility and supplied with customer's choice classification. After integration, it is subject to a thorough Factory Acceptance Test (FAT), in attendance of the Classification surveyor, owner and/or yard representative(s).





Figure 1 - CAESAR vector joystick control

The system can be extended with vector joystick control, additional functionality for bow-thruster(s), actuation of motion control devices or other functionality:

VECTOR JOYSTICK CONTROL

Coordinating settings of the PORT and STBD waterjet(s) such that the surge (X) and sway (Y) vector is in accordance with the X/Y position of the joystick. The yaw moment knob shifts the sway force along the X-axis, creating the yaw moment.

Joystick manoeuvring is done at a low impeller speed. In case of high wind-speeds, the impeller speed can be adjusted by a separate knob (up to a maximum defined speed with respect to cavitation).

For vessels where more sway manoeuvring is required, a sway-stabilisation can be added to the system. This option keeps the yaw-rate constant while executing sway motions.

For a high breadth/length (B/L) ratio, such as present for catamarans, low-speed positioning and berthing operations are possible by only using stern waterjets. However, for small B/L ratios, such as present for a monohull, a bow-thruster is needed. For the control of the bowthruster, also back-up individual control, is integrated into the coordinating cabinet controllers.

AUTO-PILOT

Automatic heading control with use of onboard Compasses(Magnetic & Gyro) and/or Satellite navigation via GPS

TRIM CONTROL

Static trim control by adjustment of the interceptors

RIDE CONTROL

Installed vertical lifting devices (T-foils and transom trimtabs) are integrated in the CAESAR ride control system with the following configuration possibilities:

- Actuation of the hydraulic actuators via servo-valves, with actuator position feedback sensors (requirement).
- Complete motion sensing system, consisting of an inertial navigation system supported by a dual GPS antenna.



Figure 2 - CAESAR ride control panel

RUDDER CONTROL

The CAEASAR system offers individual rudder control (PORT and STBD) by taking over steering from the waterjet steering nozzles at high speed.

FUEL EFFICIENCY AND EMISSION REDUCTION

Calculating the average fuel consumption for a given route. This feature compares the average and actual fuel consumption (measured over 3 wave periods). The information supports crew for optimal trim setting and speed variation.

MAINTENANCE

High reliability is ensured by using quality COTS hardware in the CAESAR PCS. Remote access and logging of abnormalities with related machinery and system states support a low Mean-Time-To-Repair. Furthermore, the availability of spare parts enables a high Mean-Time-Between-Failure and therewith craft mission availability.

AVAILABLE CAESAR SYSTEMS

Kwant Controls propulsion and steering solutions are part of the elementary systems on all kinds of vessels. Whether for primary control of steering and propulsion, backup control or emergency telegraph operations: tailored components and concepts are available for optimized operations, safety, reliability and maintainability.



At early stage of the project, by functional specification the scope and system functions are defined. This forms the basis for our engineering process towards full flush simulation tests at our in-house test-facility.

Available CAESAR Propulsion Control Systems for:

- **Fixed Pitch Propellers**
- Controllable Pitch Propellers
- Waterjets
- Rudders
- Azimuth/Steerable thrusters
- Transverse thrusters
- Motion demping

Please ask us for possibilities.











